

REMARKS

Applicant acknowledges receipt of the Office action dated January 20, 2010. Claims 1-20 were pending in the application and were examined. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

I. REJECTION UNDER 35 U.S.C. § 112

Claims 9, 11, and 17 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed.

In order to advance and expedite prosecution of the application to allowance, claims 9, 11, and 17 have been amended to remove the recitations cited by the Examiner as being indefinite. Accordingly, the Examiner is requested to withdraw the rejection of claims 9, 11, and 17 under 35 U.S.C. § 112.

II. REJECTION UNDER 35 U.S.C. § 103

Claims 1-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Rowell* (WO 01/20718) in view of *Rostbakken* (GB 2335798). This rejection is respectfully traversed.

Independent claims 1, 10, and 19 have been amended to clarify that the controllable switch comprises a diode and that the filter is a passive filter electrically connected directly to only the second edge of the second radiating element and the control voltage input. Independent claims 1, 10, and 19 have also been amended to clarify that the passive filter is arranged to block (claims 1 and 10) or operable for blocking (claim 19) radio frequency signals when a current level through the diode is between about 5 millamps and about 15 millamps when interconnecting the radiating elements.

The clarifying amendments to independent claims 1, 10, and 19 are supported by the application as originally filed. See, for example, FIG. 7 (reproduced below) of the instant application illustrates an exemplary embodiment having a switch 30 between a first edge of the first radiating element 10 and a first edge of the second radiating

element 20. Also shown in FIG. 7 is a filter 40' arranged or coupled between a second edge of the second radiating element 20 and the control voltage input. See also, for example, the instant application as published as United States Patent Application Publication 2007/0241970 at paragraph [0035] describing that the current through the diode 30 may be about 5-15 mA.

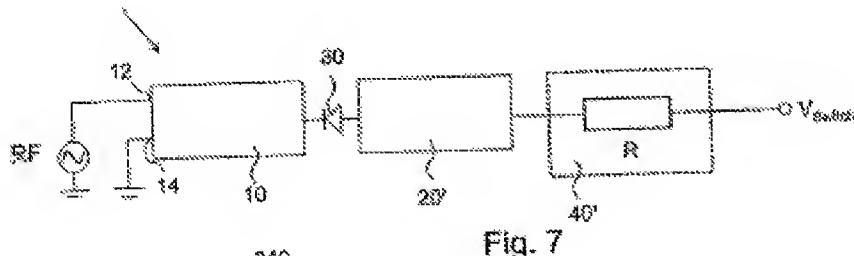


Fig. 7

In addition to the clarifications provided by the amendments, independent claims 1, 10, and 19 further recite, among other things, that the filter has a purely resistive impedance. Neither *Rowell*, nor *Rostbakken*, whether alone or in combination, discloses, teaches, suggests, or otherwise renders obvious each and every feature recited by independent claims 1, 10, and 19. Accordingly, *Rowell* and *Rostbakken* do not render claims 1-20 unpatentable.

Rowell merely discloses a controllable antenna having a control signal filtered using an LC network. Specifically, *Rowell*'s antenna 400 includes a first radiating element 421, a second radiating element 422, and a switching element 460 arranged between the radiating elements 421, 422. See *Rowell*, page 9, lines 6-10. A switching element 460 is connected between the radiating elements 421, 422. See *Rowell*, page 9, lines 13-14. The switch 460 "is connected to a control signal via a resistor 503 and a LC network comprising an inductive element 502 and a capacitive element 504" and the inductive element 502 is arranged to eliminate feedback of radiofrequency signals. *Rowell*, page 9, lines 15-16. As can be seen clearly in *Rowell* FIG. 5 (reproduced below) there is no path from the control signal to the switch 460 that is purely resistive and, accordingly, there is no purely resistive filter between the control signal and the switch 460.

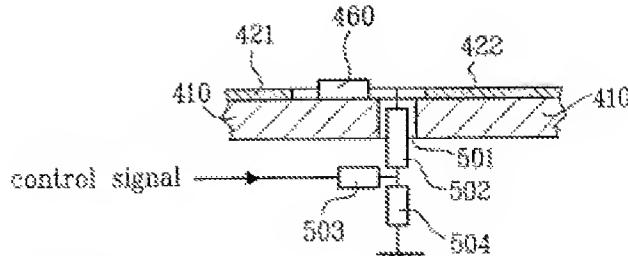
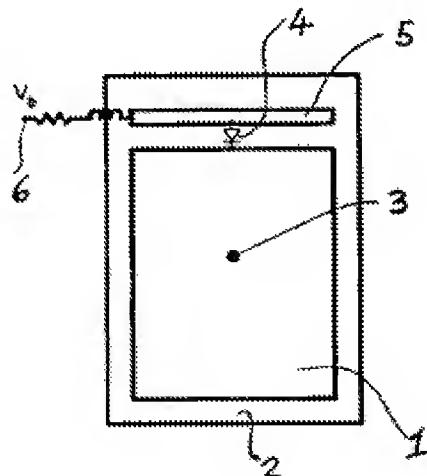


FIG. 5

Similarly, *Rostbakken* merely discloses an antenna with a PIN diode connecting two patch antennas and controlled via a control signal provided to the second patch antenna. Specifically, *Rostbakken* includes a primary patch antenna 1, a secondary patch antenna 5 and a pin diode 4 coupled between the two patch antennas 1, 5. See, for example, FIG. 1 reproduced below. A control signal is applied (at reference number 6) to the secondary patch 5 via a series connected resistor and inductor to selectively connect and disconnect the patches 1, 5 by varying the diode 4 from a short circuit to an open circuit. See, e.g., *Rostbakken*, page 3, first paragraph.



Neither *Rowell* nor *Rostbakken* discloses a passive filter that has a purely resistive impedance as recited by independent claims 1, 10, and 19. Instead, *Rowell* discloses, at most, a filter that includes both a resistor 503 and an inductive element 502 (or, as identified by the Examiner, capacitor 504). Similarly, *Rostbakken* discloses, at most, a filter comprising a resistor and an inductor (not labeled, but clearly illustrated

in FIG. 1 reproduced above). Both *Rowell* and *Rostbakken*, therefore, include a filter that has both a resistive **and** a reactive impedance. Accordingly, neither the Rowell filter nor the Rostbakken filter is a passive filter that has a purely resistive impedance without any capacitors or inductors.

To overcome the absence of a filter with a purely resistive impedance as recited by claims 1, 10, and 19, the Office asserts (without citing a reference) that it would have been obvious to substitute a filter with a purely resistive impedance for *Rowell*'s filter with resistive and reactive components. Applicant respectfully disagrees that such a modification would have been obvious to a skilled artisan for the following reasons.

An RF filter is typically provided for filtering away radio signals at different frequencies. The components of a typical passive RF filter include frequency dependent component, such as capacitors and/or inductors to provide filtering. Such filters may include one or more resistors, but only in connection with capacitors and/or inductors. Accordingly, such filters have both resistive and reactive impedance. A person of ordinary skill in the art, when considering a passive RF filter, would think of filters including a capacitor and/or an inductor. Applicant, however, realized that at the current levels (e.g., 5 to 15 mA) used in the antennas described and claimed in this application, a pure resistance will, surprisingly, act as an RF filter. As stated in paragraph [0047] of the present application as published US2007/0241970: "Due to the low DC current required to switch the PIN diode, a high resistance can be used as a filter, such as 800 Ohms. This in turn unexpectedly provides a filter blocking RF signals."

That a pure resistance could be used as an RF filter was not expected or obvious. Accordingly, Applicant respectfully submits that it would not have been obvious to replace *Rowell*'s filter (or similarly *Rostbakken*'s filter) with a filter having a purely resistive impedance as recited by claims 1, 10, and 19.

For at least this reason, independent claims 1, 10, and 19 are not obvious over *Rowell* in view of *Rostbakken*. The Examiner is, therefore, respectfully requested to reconsider and withdraw the rejection of claims 1, 10, and 19 and claims 2-9, 11-18 and 20 which depend therefrom. Furthermore, if the Examiner maintains the rejections in a further Office action, the Examiner is respectfully requested cite an appropriate

reference disclosing the use of a pure resistance as a passive RF filter in order to provide Applicant with a full and fair opportunity to respond.

Dependent claims 2-9, 11-18 and 20 depend from independent claim 1, 10, or 19, which are submitted as patentable for at least the reasons set forth above. Accordingly, claims 2-9, 11-18 and 20 are submitted as patentable at least because of their dependence from an allowable independent claim. In addition, dependent claims 2-9, 11-18, and 20 are believed to be further patentably distinguishable because *Rowell* in view of *Rostbakken* do not disclose or make obvious the additional features required by claims 2-9, 11-18, and 20 (in combination with the other features recited in the respective independent claim from which they depend).

For example, claim 2 is amended to recite that “the state of the switch is controlled for transmitting and receiving signals in the first frequency band and for transmitting and receiving signals in the second band.” This is not disclosed or taught by *Rostbakken*.

As further examples, claims 11 and 17 each recites that “the filter does not include any capacitors or inductors and the filter includes only the resistor.” But as noted above, *Rowell* discloses, at most, a filter that includes both a resistor 503 and an inductive element 502 (or, as identified by the Examiner, capacitor 504). Similarly, *Rostbakken* discloses, at most, a filter comprising a resistor and an inductor (not labeled, but clearly illustrated in FIG. 1 reproduced above). Accordingly, neither the *Rowell* filter nor the *Rostbakken* filter is a passive filter that has a purely resistive impedance that also does not include any capacitors or inductors.

Applicant respectfully submits that it would not have been obvious to substitute a filter with a purely resistive impedance for *Rowell's* filter that includes a resistor 503 and an inductive element 502. As noted above, an RF filter is typically provided for filtering away radio signals at different frequencies. The components of a typical passive RF filter include frequency dependent component, such as capacitors and/or inductors to provide filtering. Such filters may include one or more resistors, but only in connection with capacitors and/or inductors. Accordingly, such filters have both resistive and reactive impedance. A person of ordinary skill in the art, when considering a passive RF filter, would think of filters including a capacitor and/or an inductor. Applicant, however,

realized that at the current levels (e.g., 5 to 15 mA) used in the antennas described and claimed in this application, a pure resistance will, surprisingly, act as an RF filter. As stated in paragraph [0047] of the present application as published US2007/0241970: "Due to the low DC current required to switch the PIN diode, a high resistance can be used as a filter, such as 800 Ohms. This in turn unexpectedly provides a filter blocking RF signals."

That a pure resistance could be used as an RF filter was not expected or obvious. Accordingly, Applicant respectfully submits that it would not have been obvious to replace *Rowell's* filter (or similarly *Rostbakken's* filter) with a passive filter having a purely resistive impedance where "the filter does not include any capacitors or inductors and the filter includes only the resistor" as recited in claims 11 and 17. For these additional reasons, Applicant respectfully requests reconsideration and withdrawal of the rejections of claims 11 and 17.

III. CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned directly at (314) 726-7502.

Applicant believes that the correct fees have been included with this filing. If, however, Applicant does owe any fee(s), the Commissioner is hereby authorized to charge the fee(s) to Deposit Account No. **08-0750**. In addition, if there is ever any other fee deficiency or overpayment under 37 C.F.R. §1.16 or 1.17 in connection with this patent application, the Commissioner is hereby authorized to charge such deficiency or overpayment to Deposit Account No. **08-0750**. In addition, Applicant hereby requests the United States Patent & Trademark Office treat any concurrent or future reply requiring a petition for extension of time pursuant to §1.136 for its timely submission as

incorporating therein a petition for an extension of time for the appropriate length of time and authorizes the Commissioner to charge all required extension of time fees that have not otherwise been paid to Deposit Account No. **08-0750**.

Respectfully submitted,

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